REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1 and 3-22 are currently pending. Claims 1, 4-8, 10-18, and 20-22 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 3-8, 10-18, and 20-22 were objected to as containing an informality; and Claims 1 and 3-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,904,290 to Palenius (hereinafter "the '290 patent") in view of U.S. Patent Application Publication No. 2004/0018843 to Cerwall et al. (hereinafter "the '843 application") and U.S. Patent Application Publication No. 2004/0085909 to Soliman (hereinafter "the '909 application").

Applicants respectfully submit that the objections to the claims are rendered moot by the present amendment to the claims. The dependent claims have been amended to recite, for example, "the" radio control station, as opposed to "a" radio control station. Applicants respectfully submit that the amendments to the claims should be entered after final rejection and do not raise a new issue requiring further consideration by the Examiner or a question of new matter.

Claim 1 is directed to a multi-hop communication system configured by a radio control station connected to a core network and a plurality of radio stations for relaying signals there between, wherein the radio control station comprises: (1) a control signal transmission/reception unit configured to transmit/receive a control signal having a lower bit rate than an information signal and for conducting communication with the plurality of radio stations; (2) an information signal transmission/reception unit configured to transmit/receive

the information signal; and (3) a communication route determiner configured to determine a communication route through the multi-hop communication system for the control signal independently from a communication route through the multi-hop communication system for the information signal prior to conducting communication with the plurality of radio stations. Further, Claim 1 recites that the radio station comprises a control signal transmission/reception unit configured to transmit/receive the control signal; and an information signal transmission/reception unit configured to transmit/receive the information signal.

Regarding the rejection of Claim 1 under 35 U.S.C. § 103, the Office Action asserts that the '290 patent discloses everything in Claim 1 with the exception of a multi-hop system and the determination of the communication route prior to conducting communication with the plurality of radio stations, and relies on the '843 and '909 applications to remedy those deficiencies.

As discussed below, Applicants respectfully submit that the teachings of the '290 patent, the '843 application, and the '909 application are not combinable in the manner suggested in the outstanding Office Action, and that, even if the teachings of the cited references are combined in the manner suggested, the combination would not include all of the elements recited in Claim 1.

The '290 patent is directed to a cellular communication system in which a base station 100 communicates with a mobile station 110 via a cell 50. The '290 patent discloses that the cellular communication system operates using CDMA technology having duplexed downlink and uplink channels.[1] Further, the '290 patent discloses that the mobile station may have a different number of physical channels allocated to it in the downlink direction than in the

[1] See '290 patent, column 4, lines 14-32.

uplink direction.[2] Further, the '290 patent discloses that known channels such as DPCCH, DPDCH1, and DPDCH2 are controlled by a power level controller 29, such that the power level between the various channels is controlled in accordance with the power offset value received from the base station 100.[3]

However, as admitted in the outstanding Office Action, the '290 patent fails to disclose a multi-hop communication system. Further, Applicants respectfully submit that the '290 patent fails to disclose a radio control station that includes a communication route determiner configured to determined a communication route through the multi-hop communication system for the control signal **independently from** a communication route through the multi-hop communication system for the information signal prior to conducting communication with the plurality of radio stations, as recited in Claim 1. Rather, the '290 patent merely discloses the allocation of a dedicated channel for user bits and a dedicated channel for control information. ***However, the dedicated channels disclosed by the '290 patent are unrelated to a multi-hop system***. Further, the '290 patent does not teach or suggest a communication route determiner to determine communication routes. Moreover, the '290 patent does not teach or suggest that a communication route through the multi-hop communication system is determined for the control signal ***independently from*** a communication route through the multi-hop communication system for the information signal, as required by Claim 1.

The '843 patent is directed to a method for determining a radio channel for a mobile station including the steps of selecting at least one candidate radio channel among a plurality of radio channels, measuring the quality of the at least one candidate radio channel, estimating the interference effects on the existing radio connections of establishing a radio

[2] See '290 patent, column 4, lines 35-38.
[3] See '290 patent, column 5, lines 23-32.

connection on the candidate radio channel, and determining a radio channel for communication based on the radio channel quality measurement and the interference estimate. However, Applicants respectfully submit that the '843 patent fails to disclose the communication route determiner recited in amended Claim 1. The '843 patent is not directed to a multi-hop communication system and does not disclose the independent determination of a communication route for the control signal and a communication route for the information signal, as recited in amended Claim 1.

The '909 application is directed to a method and apparatus for scheduling transmissions in a wireless communication system using historical information and usage patterns for remote users in the system. In particular, the '909 application discloses that an ad-hoc network 600 may change with time as the mobile nodes change location, and that transmissions to a user may be scheduled according to the location of the user and a prediction of the future location of the user based on historical travel routes.[4]

However, Applicants respectfully submit that the '909 patent fails to disclose a communication route determiner configured to determine a communication route through a multi-hop communication system for the control signal **independently from** a communication route through the multi-hop communication system for the information signal prior to conducting communication with the plurality of radio stations, as recited in amended Claim 1. The '909 patent does not disclose an independent determination of a communication route through a multi-hop system for a control signal and a communication route through a multi-hop communication system for an information signal. Rather, the '909 patent merely discloses that, in an ad-hoc or hybrid system, usage patterns are used to determine the source-to-destination paths.

[4] See '909 application, paragraphs 52-56.

Thus, no matter how the teachings of the '290 patent, the '843 application and the '909 application are combined, the combination does not teach or suggest a communication route determiner configured to determine a communication route through the multi-hop communication system for the control signal **independently from** a communication route through the multi-hop communication system for the information signal prior to conducting communication with the plurality of radio stations, as recited in amended Claim 1.

Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and that the rejection of Claim 1 should be withdrawn.

Further, Applicants respectfully submit that there is no technological motivation to combine the teachings of the '290 patent and the '909 application. The DPCCH and DPDCH wireless channels disclosed by the '290 patent are channels that are set between a mobile terminal and a base station for communication **only** between the mobile terminal and the base station. Thus, it is not possible in the '290 system that the communication route of the DPCCH channel differs from the communication route of the DPDCH channel. Thus, Applicants respectfully submit that the dedicated channels disclosed by the '290 patent are not relevant in a multi-hop system and are unrelated to determining communication routes through a multi-hop communication system, as required by Claim 1. In other words, if one of ordinary skill in the art started with the multi-hop system disclosed by the '909 application, the disclosure of the '290 dedicated control channels between a mobile and a base station would be unhelpful in solving the problem of determining a communication route through the multi-hip communication system for a **control signal** independently from a communication route through the multi-hop communication system for the **information signal**, as required by Claim 1. The '290 patent does not disclose that such routes could or should be determined

independently, as required by Claim 1. Further, the '290 dedicated channels are not useful for determining how to transmit and receive information in a multi-hop system.

Further, regarding Claim 4, Applicants respectfully submit that the cited references fail to disclose a communication route determiner that determines a communication route through a multi-hop system for the information signal ***by a different independent process*** from the determination of the communication route through the multi-hop communication system for the control signal. Applicants respectfully submit that the combination of the cited references does not disclose the "different independent process" recited in Claim 4. In this regard, Applicants note that the outstanding Office Action asserts that this limitation is taught by column 4, lines 15-44 of the '290 patent. However, an examination of that section in the '290 patent reveals that it is directed to the communication between the mobile station and the base station, using dedicated channels, as shown in Figure 2. That section of the '290 patent is unrelated to determining communication routes using different independent processes, as required by Claim 4.

Independent Claims 3, 9, and 19 recite limitations analogous to the limitations recited in Claim 1. Accordingly, for reasons analogous to the reasons stated above for the patentability of Claim 1, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and that the rejection of Claims 3, 9, and 19 (and all associated dependent claims) should be withdrawn.

Thus, it is respectfully submitted that independent Claims 1, 3, 9, and 19 (and all associated dependent claims) patentably define over any proper combination of the '290 patent, the '843 application, and the '909 application.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Kurt M. Berger

Bradley D. Lytle
Attorney of Record
Registration No. 40,073

Kurt M. Berger, Ph.D.
Registration No. 51,461

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

I:\ATTY\KMB\249'S\249205US\249205US-AM-REVISED_DUE-7-18-07.DOC